

CLAIMS

What is claimed is:

1. A seal adapted for use with a valve having a valve closing member rotatably mounted within a housing, said seal comprising:

a flexible, resilient loop having a perimeter sealing surface and a perimeter mounting surface positioned substantially opposite to said perimeter sealing surface, said perimeter sealing surface being engageable with one of said valve closing member and said housing to sealingly close said valve, said perimeter mounting surface being engageable with the other of said valve closing member and said housing for mounting said loop within said valve;

a first surface extending between said perimeter sealing surface and said perimeter mounting surface;

a second surface positioned opposite to said first surface and extending between said perimeter sealing surface and said perimeter mounting surface;
and

a channel positioned on one of said first and second surfaces and extending from said perimeter mounting surface toward said perimeters sealing surface.

2. A seal according to Claim 1, wherein said perimeter sealing surface faces inwardly of said loop and is engageable with said valve closing member, said perimeter mounting surface facing outwardly of said loop and being engageable with said housing for mounting therein.

3. A seal according to Claim 1, wherein said perimeter sealing surface faces outwardly of said loop and is engageable with said housing, said perimeter mounting surface facing inwardly of said loop and being engageable with said valve closing member for mounting thereon.

4. A seal according to Claim 1, further comprising a plurality of said channels positioned in spaced relation from one another on said one surface around said loop.

5. A seal according to Claim 1, further comprising a plurality of said channels positioned on said first and said second surfaces.

6. A seal according to Claim 1, wherein said loop is substantially circular in shape.

7. A seal according to Claim 6, wherein said perimeter sealing surface has a wedge-shaped cross sectional profile.

8. A seal according to Claim 7, wherein said perimeter sealing surface has a curved cross-sectional profile.

9. A seal according to Claim 7, wherein said wedge shaped cross section is asymmetrical.

10. A seal according to Claim 1, further comprising a void space positioned in said perimeter mounting surface.

11. A seal according to Claim 10, wherein said void space comprises a groove extending around said perimeter mounting surface.

12. A seal according to Claim 11, wherein said groove extends continuously around said entire perimeter mounting surface.

13. A seal according to Claim 10, wherein said void space comprises a plurality of grooves extending around said perimeter mounting surface.

14. A seal according to Claim 13, wherein said grooves extend continuously around said entire perimeter mounting surface.

15. A seal according to Claim 13, wherein said grooves extend around said perimeter mounting surface in a zig-zag pattern.

16. A seal according to Claim 10, wherein said void space comprises a plurality of grooves positioned in spaced relation around said perimeter mounting surface, said grooves being oriented transversely to a plane defined by said loop.

17. A seal according to Claim 16, wherein said grooves are oriented perpendicular to said plane.

18. A seal according to Claim 10, wherein said void space comprises a plurality of dimples positioned in said perimeter mounting surface.

19. A seal according to Claim 10, wherein said void space is defined by a raised surface portion extending outwardly from said perimeter mounting surface, said void space being adjacent to said raised surface portion.

20. A seal according to Claim 19, wherein said raised surface portion extends around said perimeter mounting surface.

21. A seal according to Claim 10, wherein said void space is defined by angularly orienting portions of said perimeter mounting surface relative to one another.

22. A seal adapted for use with a valve having a rotatable valve closing member mounted within a housing, said seal comprising:

a flexible, resilient loop having a perimeter sealing surface and a perimeter mounting surface positioned substantially opposite to said perimeter sealing surface, said perimeter sealing surface being engageable with one of said valve closing member and said housing to sealingly close said valve, said perimeter mounting surface being engageable with the other of said valve closing member and said housing for mounting said loop within said valve;

a first surface extending between said perimeter sealing surface and said perimeter mounting surface;

a second surface positioned opposite to said first surface and extending between said perimeter sealing surface and said perimeter mounting surface;
and

a void space positioned in said perimeter mounting surface.

23. A seal according to Claim 22, wherein said perimeter sealing surface faces inwardly of said loop and is engageable with said valve closing member, said perimeter mounting surface facing outwardly of said loop and being engageable with said housing for mounting therein.

24. A seal according to Claim 22, wherein said perimeter sealing surface faces outwardly of said loop and is engageable with said housing, said perimeter mounting surface facing inwardly of said loop and being engageable with said valve closing member for mounting thereon.

25. A seal according to Claim 22, wherein said loop is substantially circular in shape.

26. A seal according to Claim 25, wherein said perimeter sealing surface has a curved cross-sectional profile.

27. A seal according to Claim 22, wherein said void space comprises a groove extending around said perimeter mounting surface.

28. A seal according to Claim 27, wherein said groove extends continuously around said entire perimeter mounting surface.

29. A seal according to Claim 22, wherein said void space comprises a plurality of grooves extending around said perimeter mounting surface.

30. A seal according to Claim 29, wherein said grooves extend continuously around said entire perimeter mounting surface.

31. A seal according to Claim 29, wherein said grooves extend around said perimeter mounting surface in a zig-zag pattern.

32. A seal according to Claim 29, wherein said grooves are positioned in spaced relation around said perimeter mounting surface and oriented transversely to a plane defined by said loop.

33. A seal according to Claim 32, wherein said grooves are oriented perpendicular to said plane.

34. A seal according to Claim 22, wherein said void space comprises a plurality of dimples positioned in said perimeter mounting surface.

35. A seal according to Claim 34, wherein said dimples are positioned in spaced relation around said perimeter mounting surface.

36. A seal according to Claim 22, wherein said void space is defined by a raised surface portion extending outwardly from said perimeter mounting surface, said void space being adjacent to said raised surface portion.

37. A seal according to Claim 36, wherein said raised surface portion extends around said perimeter mounting surface.

38. A seal according to Claim 22, wherein said void space is defined by angularly orienting portions of said perimeter mounting surface relative to one another.

39. A seal according to Claim 22, further comprising a channel positioned on one of said first and said second surfaces and extending from said perimeter mounting surface toward said perimeter sealing surface.

40. A seal according to Claim 39, further comprising a plurality of said channels positioned in spaced relation from one another on said one surface around said loop.

41. A seal according to Claim 39, further comprising a plurality of said channels positioned on said first and said second surfaces.

42. A valve for controlling fluid flow, said valve comprising:

- a housing;

- a valve closing member rotatably mounted within said housing and movable between an open position permitting fluid flow through said valve, and a closed position preventing said fluid flow; and

- a flexible, resilient loop positioned within said housing surrounding said closing member, said loop having a perimeter sealing surface engageable with one

of said closing member and said housing for providing a fluid tight seal therebetween when said closing member is in said closed position, said loop having a perimeter mounting surface engageable with the other of said closing member and said housing for mounting said loop thereon, said loop further comprising first and second surfaces extending between said perimeter mounting surface and said perimeter sealing surface, said second surface being positioned opposite to said first surface, a channel being positioned on one of said first and said second surfaces and extending from said perimeter mounting surface toward said perimeter sealing surface.

43. A seal according to Claim 42, further comprising a cavity positioned within said housing substantially surrounding said valve closing member, said perimeter mounting surface facing outwardly of said loop and being positioned within said cavity for mounting therein, said perimeter sealing surface facing inwardly of said loop and extending from said cavity for engagement with said valve closing member.

44. A seal according to Claim 42, further comprising a cavity positioned within and substantially surrounding said valve closing member, said perimeter mounting surface facing inwardly of said loop and being positioned within said cavity for mounting therein, said perimeter sealing surface facing outwardly of said loop and extending from said cavity for engagement with said housing.

45. A valve according to Claim 42, wherein said loop further comprises a plurality of said channels

positioned in spaced relation from one another in said one surface around said loop.

46. A valve according to Claim 42, wherein said loop further comprises a plurality of said channels positioned in said first and said second surfaces.

47. A valve according to Claim 42, wherein said seal further comprises a void space positioned in said perimeter mounting surface.

48. A valve according to Claim 47, wherein said void space comprises a groove extending around said perimeter mounting surface.

49. A valve according to Claim 48, wherein said groove extends continuously around said entire perimeter mounting surface.

50. A valve according to Claim 47, wherein said void space comprises a plurality of grooves extending around said perimeter mounting surface.

51. A valve according to Claim 50, wherein said grooves extend continuously around said entire perimeter mounting surface.

52. A valve according to Claim 50, wherein said grooves extend around said perimeter mounting surface in a zig-zag pattern.

53. A valve according to Claim 47, wherein said void space comprises a plurality of grooves positioned in spaced relation around said perimeter mounting

surface, said grooves being oriented transversely to a plane defined by said loop.

54. A valve according to Claim 53, wherein said grooves are oriented perpendicular to said plane.

55. A valve according to Claim 47, wherein said void space comprises a plurality of dimples positioned in said perimeter mounting surface.

56. A valve according to Claim 47, wherein said void space is defined by a raised surface portion extending outwardly from said perimeter mounting surface, said void space being adjacent to said raised surface portion.

57. A valve according to Claim 56, wherein said raised surface portion extends around said perimeter mounting surface.

58. A valve according to Claim 47, wherein said void space is defined by angularly orienting portions of said perimeter mounting surface relative to one another.

59. A valve for controlling fluid flow, said valve comprising:

a housing;

a valve closing member rotatably mounted within said housing and movable between an open position permitting fluid flow through said valve, and a closed position preventing said fluid flow; and

a flexible, resilient loop positioned within said housing surrounding said closing member, said loop

having a perimeter sealing surface engageable with one of said closing member and said housing for providing a fluid tight seal therebetween when said closing member is in said closed position, said loop having a perimeter mounting surface engageable with the other of said closing member and said housing for mounting said loop thereon, said loop further comprising first and second surfaces extending between said perimeter mounting surface and said perimeter sealing surface, said second surface being positioned opposite to said first surface, a void space being positioned in said perimeter mounting surface.

60. A valve according to Claim 59, further comprising a cavity positioned within said housing substantially surrounding said valve closing member, said perimeter mounting surface facing outwardly of said loop and being positioned within said cavity for mounting therein, said perimeter sealing surface facing inwardly of said loop and extending from said cavity for engagement with said valve closing member.

61. A valve according to Claim 59, further comprising a cavity positioned within and substantially surrounding said valve closing member, said perimeter mounting surface facing inwardly of said loop and being positioned within said cavity for mounting therein, said perimeter sealing surface facing outwardly of said loop and extending from said cavity for engagement with said housing.

62. A valve according to Claim 59, wherein said void space comprises a groove extending around said perimeter mounting surface.

63. A valve according to Claim 62, wherein said groove extends continuously around said entire perimeter mounting surface.

64. A valve according to Claim 59, wherein said void space comprises a plurality of grooves extending around said perimeter mounting surface.

65. A valve according to Claim 64, wherein said grooves extend continuously around said entire perimeter mounting surface.

66. A valve according to Claim 64, wherein said grooves extend around said perimeter mounting surface in a zig-zag pattern.

67. A valve according to Claim 64, wherein said grooves are positioned in spaced relation around said perimeter mounting surface and oriented transversely to a plane defined by said loop.

68. A valve according to Claim 67, wherein said grooves are oriented perpendicular to said plane.

69. A valve according to Claim 59, wherein said void space comprises a plurality of dimples positioned in said perimeter mounting surface.

70. A valve according to Claim 69, wherein said dimples are positioned in spaced relation around said perimeter mounting surface.

71. A valve according to Claim 59, wherein said void space is defined by a raised surface portion

extending outwardly from said perimeter mounting surface, said void space being adjacent to said raised surface portion.

72. A valve according to Claim 71, wherein said raised surface portion extends around said perimeter mounting surface.

73. A valve according to Claim 59, wherein said void space is defined by angularly orienting portions of said perimeter mounting surface relative to one another.

74. A valve according to Claim 59, further comprising a channel positioned on one of said first and said second surfaces and extending from said perimeter mounting surface toward said perimeter sealing surface.

75. A valve according to Claim 74, further comprising a plurality of said channels positioned in spaced relation from one another on said one surface around said loop.

76. A valve according to Claim 74, further comprising a plurality of said channels positioned on said first and said second surfaces.